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EXAMINER	
PHILPOTT, JUSTIN M	

ART UNIT	PAPER NUMBER
2665	

DATE MAILED: 12/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/510,905	THODIYIL, JOHN A.	
	Examiner	Art Unit	
	Justin M Philpott	2665	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 September 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5-22 and 24-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5-22 and 24-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Response to Amendment

1. In the Amendment filed September 2, 2003, Applicant has amended claim 32 which is accordingly no longer objected to, and has argued that the pending claims should be allowed.

Response to Arguments

2. Applicant's arguments filed September 2, 2003 have been fully considered but they are not persuasive.

First, Applicant argues (page 12, section II.A.1) that Delp does not associate priorities with descriptors or data described by descriptors as recited in lines 4-5 of Applicant's claim 1. However, Delp clearly teaches data descriptors (e.g., LC descriptors 206 in FIG. 2 which may comprise data descriptors as disclosed in col. 6, lines 63-65) describe a data portion (e.g., data in queues 204) having an associated priority, wherein the priority of the data portion is determined by the priority of a channel or LCD (e.g., see col. 5, line 34 – col. 6, line 53 regarding priority). Thus, Delp does in fact teach associating priorities with descriptors and/or data described by descriptors as recited in claim 1. Applicant further argues that in the system of Delp, changing a data cell's priority would not change how it is scheduled, whereas in Applicant's invention scheduling data based on the data's priority allows the scheduling to be dynamically altered by putting different data into different memories with different target amount of data to be scheduled. However, in response to applicant's argument that the reference fails to show certain features of Applicant's invention, it is noted that the features upon which Applicant relies (i.e., scheduling data based on the data's priority allows the scheduling to be dynamically altered by

putting different data into different memories with different target amount of data to be scheduled) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Second, Applicant argues (pages 12-13, section II.A.2) that contrary to lines 9-11 of Applicant's claim 1, the teachings of Delp do not provide means for changing how much data a specific channel could prepare for transmission. However, Delp teaches placing a limit or weight for the memories wherein the limit or weight corresponds to a threshold time associated with the priority (e.g., see col. 5, lines 49-56), and wherein a threshold time implicitly corresponds to a threshold data amount based upon the bit rate which is well known in the art. Applicant further argues that adjusting either a time slot window or bit rate would affect all channels. However, no such indication of adjusting the bit rate has been made by the Examiner. Rather, it is the Examiner's contention that by placing a limit on the amount of time for a timing wheel, Delp provides means for maintaining a dynamic weight for the memories wherein the weight corresponds to a threshold amount of data according to the time and the established bit rate. Therefore, Delp teaches the above limitations recited in claim 1.

Third, Applicant argues (page 13, section II.A.3) that Delp has no need or ability to determine if a threshold amount has been exceeded as recited in lines 17-19 of Applicant's claim 1. Applicant further argues that the citation of Delp (e.g., col. 7, lines 45-67) is regarding a timing issue and not a threshold. However, the "threshold" in consideration is that discussed above regarding section II.A.2, wherein Delp teaches such a threshold by providing a threshold time which corresponds to a threshold amount of data. Thus, Delp teaches determining whether

the threshold amount of data has been exceeded by determining whether the threshold amount of time has been exceeded.

Fourth, Applicant argues (pages 13-14, section II.A.4) that, similar to the above arguments regarding sections II.A.2 and II.A.3, Delp's teachings are directed towards adjusting the allotted time and not adjusting how much data is scheduled. However, the "threshold" in consideration is that already discussed, wherein Delp teaches such a threshold by providing a threshold time which corresponds to a threshold amount of data. Thus, by teaching adjusting the allotted time for transmission, Delp teaches adjusting the amount of data scheduled by determining an adjusted allotted time having an established bit rate.

Fifth, Applicant argues (page 14, section C) that no components or portions of the system of Delp were cited against the elements of claim 25, and specifically, Delp does not include an arbiter for monitoring an amount of data retrieved during a servicing turn. However, included within the paragraph regarding claims 1, 3, 11, 12, 24, 25 and 32, after the discussion of claim 1, the additional elements of claim 25 are discussed both in the previous office action (first full paragraph after numeral 4) and in the instant office action below. Specifically, regarding claim 25, Delp teaches an arbiter monitors an amount of data received by means of step 720 (see FIG. 7A) and to be placed in a transmission queue (e.g., transmission preparation logic 208).

Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 1-3, 5-7, 9-22 and 24-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,844,890 to Delp et al.

Regarding claims 1, 3, 11, 12, 24, 25 and 32, Delp teaches a method of scheduling data (e.g., via cell scheduler 102 in FIGS. 1 and 2) for transmission over a communication link based on priorities assigned to the data (e.g., see col. 5, lines 23-25 regarding multiple priorities of traffic), comprising: receiving multiple descriptors (e.g., descriptors 206 in FIG. 2) at a communication interface device, each of the descriptors describing a data portion having an associated priority (e.g., see col. 6, lines 63-65 regarding data descriptors; and see col. 5, line 34 – col. 6, line 53 regarding priority wherein the priority of the data corresponds with the priority of the assigned timing wheel); storing the descriptors in a plurality of memories (e.g., see col. 6, line 63 regarding queue of data descriptors) on the communication interface device, wherein each of the memories is configured to store one or more of the descriptors describing data associated with a predetermined priority; maintaining a dynamic weight (e.g., see col. 5, lines 49-56 regarding time slot window) for each of the plurality of memories, wherein each dynamic weight corresponds to a threshold amount of data associated with the predetermined priority (wherein the time slot window and bit rate determine the data amount); and servicing the plurality of memories, wherein each servicing of one of the plurality of memories comprises: (a) receiving a descriptor from the serviced memory (e.g., see col. 6, lines 65-67); (b) retrieving data described by the received descriptor (e.g., see col. 6, line 67 – col. 7, line 2); (c) scheduling the data for transmission via the communication link (e.g., see col. 7, lines 2-3); (d) determining whether an amount of data scheduled during the servicing for transmission via the communication link exceeds the threshold amount of data corresponding to the dynamic weight

for the serviced memory (e.g., see col. 8, lines 45-67 and FIG. 7 regarding checking whether slow wheel boundary is crossed); (e) repeating states (a) through (d) for a next descriptor in the serviced memory if the amount of data scheduled for transmission during the servicing is less than the threshold amount of data (e.g., return from step 710 back to step 702); and (f) if the amount of data scheduled for transmission exceeds the threshold amount of data, changing the threshold for a next servicing of the serviced memory (e.g., see col. 9, lines 37-54 wherein a new time slot is calculated). Further, regarding claims 3, 11 and 24, the combined steps of FIGS. 7, 7A and 7B inherently comprise determining whether one of the weights (e.g., time slot) has changed and maintaining a first deficit proportional to the excess of the threshold (e.g., see steps 720 and 722). Further, regarding claim 25, Delp teaches an arbiter monitors an amount of data received by means of step 720 (see FIG. 7A) and to be placed in a transmission queue (e.g., transmission preparation logic 208). While Delp may not specifically disclose that changing the threshold for a next servicing comprises decreasing the threshold, it is well known in the art that changing a threshold comprises either increasing or decreasing the threshold. Furthermore, by decreasing the threshold for a next servicing when the amount of data scheduled for a transmission exceeds the threshold in a current servicing, a fair or proportional amount of bandwidth can be allocated wherein the excess use of allocated bandwidth occurring in the current servicing is balanced with a reduced allocation of bandwidth for a next servicing. Similarly, Delp specifically teaches a scheduling method which is designed to provide proportional use of available network bandwidth (e.g., see col. 3, lines 15-21). Thus, at the time of the invention it would have been obvious to one of ordinary skill in the art to decrease the

threshold of Delp in order to suitably provide proportional use of available network bandwidth as suggested by Delp (e.g., see col. 3, lines 15-21).

Regarding claim 2, Delp teaches determining if the serviced memory contains a descriptor (e.g., see col. 6, lines 31-42 regarding LCD).

Regarding claim 5, Delp teaches if any of the dynamic weights changes prior to the next servicing, reinstating the pre-decreased threshold for the next servicing (e.g., see col. 9, lines 40-48 wherein the new timestamp may equal the old timestamp with a sustained interval).

Regarding claim 6, Delp teaches determining if a first memory (e.g., corresponding to entries on the slow timing wheel) of the plurality of memories contains less than a predetermined number of descriptors (e.g., see col. 9, lines 19-23 regarding entries within a predefined segment) and wherein a request to a host computer (e.g., computing system, see col. 5, line 3) implicitly comprises identifying the first memory.

Regarding claim 7, Delp teaches the first descriptor (e.g., LCD 206) comprises an identifier of a storage area (e.g., data cell queue 204 or slot in the timing wheel) on the host containing the first set of data (e.g., cell) (e.g., see col. 6, lines 11-21 and FIG. 2).

Regarding claim 9, Delp teaches the dynamic weights are dynamically modifiable to adjust the threshold amounts of data (e.g., see col. 9, lines 37-54).

Regarding claims 10 and 20, Delp teaches the interface device is a network interface circuit (e.g., network interface 104 in FIG. 1) and the communication link is a network.

Regarding claim 13, while Delp may not specifically disclose setting the first deficit to zero if a weight changes, it is implicit in the system of Delp for a threshold to change upon a weight change and a change in the threshold implicitly requires reconfiguring a deficit. Thus, at

the time of the invention it would have been obvious to one of ordinary skill in the art to set the first deficit to zero if a weight changes in order to properly reconfigure the deficit upon a changed threshold caused by a change in a weight.

Regarding claim 14, Delp teaches determining whether the first memory is empty (e.g., see col. 9, lines 19-23, e.g., wherein a first memory corresponds with a segment of the slow timing wheel).

Regarding claim 15, Delp teaches, as discussed above regarding claim 1, entering an additional servicing (e.g., terminating the first servicing turn and repeating steps (a)-(d)) if the data scheduled for transmission exceeds the first threshold.

Regarding claim 16, Delp teaches incrementing a data counter (e.g., state(i), see col. 6, lines 11-53) and comparing the data counter to the first threshold (e.g., see col. 9, lines 37-54 regarding comparing timestamp and current time).

Regarding claim 17, Delp teaches the data unit is a cell (e.g., see col. 6, line 17) which implicitly comprises a byte.

Regarding claim 18, Delp teaches the method as described above regarding claim 11, and further teaches servicing a second memory (e.g., next LCD) until it is determined to be empty (e.g., see col. 8, lines 18-44).

Regarding claim 19, Delp teaches a first memory corresponds to data having a highest priority (e.g., higher priority traffic, see col. 5, lines 25-28) and upon a weight change (e.g., reconfiguring scheduling) the first memory (corresponding to higher priority traffic) is the next memory serviced (e.g., see col. 5, lines 13-33).

Regarding claim 21, while Delp may not specifically disclose the first dynamic weight (e.g., corresponding to the time slot window) is approximately equal to a maximum packet size of the communication link, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide a time slot which accommodates the maximum packet size of the communication link in order to suitably accommodate each packet which is to be processed on the communication link.

Regarding claim 22, while Delp may not specifically disclose the second dynamic weight is approximately equal to one, it is generally considered to be within the ordinary skill in the art to adjust, vary, select or optimize the numerical parameters or values of any system absent a showing of criticality in a particular recited value. The burden of showing criticality is on Appellant. In re Mason, 87 F.2d 370, 32 USPQ 242 (CCPA 1937); Marconi Wireless Telegraph Co. v. U.S., 320 U.S. 1, 57 USPQ 471 (1943); In re Schneider, 148 F.2d 108, 65 USPQ 129 (CCPA 1945); In re Aller, 220 F.2d 454, 105 USPQ 233 (CCPA 1955); In re Saether, 492 F.2d 849, 181 USPQ 36 (CCPA 1974); In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977); In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Thus, at the time of the invention it would have been obvious to one of ordinary skill in the art to have the second dynamic weight approximately equal to one since it is generally considered to be within the ordinary skill in the art to adjust, vary, select or optimize the numerical parameters or values of any system absent a showing of criticality in a particular recited value.

Regarding claims 26 and 27, Delp teaches a loader (e.g., transmission selection logic cell scheduler 102, see FIG. 2) configured to retrieve a first packet for placing in the transmission queue (e.g., transmission preparation logic 208) during the servicing turn of the first memory,

and to load a next descriptor (e.g., LCD 206) for storage in a memory (e.g., queue of data descriptors) (e.g., see col. 6, line 61 – col. 7, line 3).

Regarding claim 28, Delp teaches determining whether an amount of data data placed in the transmission queue during the first servicing turn of the first memory exceeds a first preferred amount of data to be placed in the transmission queue during the first servicing turn of the first memory (e.g., see col. 8, lines 45-67 and FIG. 7 regarding checking whether slow wheel boundary is crossed).

Regarding claims 29 and 30, see the above regarding claim 11.

Regarding claim 31, Delp teaches a multiplexer (e.g., switching/routing system 112, see FIG. 1) configured to pass the descriptor corresponding to a first packet to the above-mentioned arbiter and loader (e.g., cell scheduler 102) during the first servicing turn of one of the first and second memory.

5. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Delp in view of U.S. Patent No. 5,732,094 to Petersen et al.

Regarding claim 8, Delp teaches the method as described above regarding claim 1, however, may not specifically disclose transmitting the data scheduled for transmission via the communication link before the entire contents of a packet comprising the scheduled data are scheduled for transmission. Petersen teaches packet transmission of data in a network via a communications link similar to Delp and further teaches transmitting the data scheduled for transmission via the communication link before the entire contents of a packet comprising the scheduled data are scheduled for transmission (e.g., see Abstract, lines 8-12). Such transmission

by Petersen provides means for transmitting stream data wherein early sections of data packets can be received and accordingly processed at an increased rate. Thus, at the time of the invention it would have been obvious to one of ordinary skill in the art to apply this teaching of Petersen to the method of Delp in order to transmit stream data wherein early sections of data packets can be received and accordingly processed at an increased rate.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Justin M Philpott whose telephone number is 703.305.7357. The examiner can normally be reached on M-F, 9:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy D Vu can be reached on 703.308.6602. The fax phone number for the organization where this application or proceeding is assigned is 703.872.9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703.305.4750.

Justin M Philpott

HUY D. VU
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